

Office Action Summary	Application No.	Applicant(s)
	10/722,599	MAEDA ET AL.
	Examiner	Art Unit
	Kevin M. Bernatz	1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on ____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 15-27 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) Claim(s) ____ is/are allowed.
- 6) Claim(s) 15-27 is/are rejected.
- 7) Claim(s) ____ is/are objected to.
- 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on ____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. ____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/28/03 ; 3/27/06
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: ____.

DETAILED ACTION

Response to Amendment

1. Cancellation of claims 1 - 14, and addition of new claims 15 - 27, filed on April 7, 2006, have been entered in the above-identified application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

3. Claims 15 – 17, 19, 20, 25 and 26 are rejected under 35 U.S.C. 102(a), (b) and/or (e) as being anticipated by Suzuki et al. (U.S. Patent No. 6,599,646 B2).

Regarding claim 15, Suzuki et al. disclose a perpendicular magnetic recording medium (col. 4, lines 56 - 57) comprising a substrate (col. 7, lines 50 - 53), an underlayer formed on the substrate meeting applicants' claimed material limitations (*Figure 1D, element 40 and col. 5, lines 51 – 59: {Pt, Pd or Au} combined with MgO*) and a magnetic layer directly formed on the underlayer (col. 1, lines 49 – 65 and col. 5, lines 51 – 59: *where the Examiner notes that the soft-magnetic layer 30 and the non-magnetic layer 20 are optional layers only required when a dual-layered recording medium is desired*) meeting applicants' claimed material limitations (*element 10'*) and containing crystal grains having an L1₀ structure (col. 4, lines 56 – 65).

Regarding claims 16 and 17, Suzuki et al. disclose crystal grains meeting applicants' claimed orientation limitations (*Figure 1D*).

Regarding claims 19 and 20, Suzuki et al. disclose embodiments meeting applicants' claimed molar compositions (*col. 5, lines 18 - 30*).

Regarding claims 25 and 26, Suzuki et al. disclose magnetic layers meeting applicants' claimed thickness limitations (*col. 5, lines 38 - 44*).

Claim Rejections - 35 USC § 103

4. Claims 15 – 20, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. ('646 B2) as applied above.

Regarding claims 15 – 17, 19, 20, 25 and 26, Suzuki et al. is relied upon as described above.

While the Examiner deems there is sufficient specificity to anticipate the claimed limitations, the Examiner acknowledges that Suzuki et al. fail to explicitly disclose an embodiment meeting applicants' claimed underlayer composition, or a Figure explicitly disclosing the magnetic layer directly adjacent the underlayer.

However, Suzuki et al. teach the equivalence of underlayers comprising a compound of Pt, Pd or Au with MgO to similar underlayer materials (*col. 5, lines 51 - 590*, where MgO is specifically taught as being advantageously used to form L_{1₀} crystal structure films since a lower film forming temperature can be used (*col. 5, lines 32 – 37*).

Furthermore, the Examiner notes that Suzuki et al. teach the functional equivalence of using a single or double layered perpendicular recording medium, and it would have been obvious to form the magnetic layer directly adjacent the underlayer

where a single layered perpendicular recording medium was desired, as opposed to a dual layered recording medium including a soft magnetic layer. The use of a single layered structure would ease production costs since less layers and raw material variety would be required, while still allowing for good recording performance.

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant(s) invention to modify the device of Suzuki et al. to meet applicants' claimed limitations as taught by Suzuki et al., since such an underlayer is a known equivalent L₁₀-type underlayer and has the added benefit of being capable of being formed at lower film forming temperatures and forming the magnetic layer directly on the underlayer is a known functional equivalent to a dual layered perpendicular recording medium with reduced production costs.

Regarding claim 18, Suzuki et al. fail to disclose the amount of MgO to use in a compound of {Pt, Pd, Au or Fe} with MgO.

However, the Examiner deems that it would have been obvious to one having ordinary skill in the art to have determined the optimum value of a results effective variable such as the relative amounts of the various components through routine experimentation, especially given the teaching in Suzuki et al. regarding the desire to produce a layer possessing a L₁₀ crystal structure and the relatively small number of compounds listed as suitable for the layer. *In re Boesch*, 205 USPQ 215 (CCPA 1980); *In re Geisler*, 116 F. 3d 1465, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997); *In re Aller*, 220 F.2d, 454, 456, 105 USPQ 233, 235 (CCPA 1955).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Suzuki et al. to use an underlayer meeting applicants' claimed composition limitations as taught by Suzuki et al., since the optimization of the relative amounts of MgO to {Pt, Pd, Au or Fe} while still producing a layer possessing a L₁₀ crystal structure would be within the knowledge of one of ordinary skill in the art.

5. Claims 21 - 24 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. ('646 B2) as applied above in Paragraphs 3 and/or 4, and further in view of Chen et al. (U.S. Patent App. No. 2004/0191578 A1).

Suzuki et al. is relied upon as described above.

Regarding claims 21 - 23, Suzuki et al. fail to disclose a crystal orientation layer meeting applicants' claimed composition limitations.

However, Chen et al. teach forming a Cr-alloy layer meeting applicants' claimed composition limitations under a L₁₀ structured layer in order to facilitate the orientation of the L₁₀ structured layer (*Paragraphs 0031 – 0033*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Suzuki et al. to utilize a Cr-alloy layer meeting applicants' claimed composition limitations as taught by Chen et al. between the L₁₀ structured underlayer and the substrate, since such a Cr-alloy layer can facilitate the orientation of the L₁₀ structured layer.

Regarding claim 24, Chen et al. teach forming a seed layer under the Cr-alloy layer to decrease the crystal size of the Cr-alloy layer (*Paragraph 0033*).

Regarding claim 27, Chen et al. teach adding a protecting layer to a recording medium to provide improved mechanical protection (*Figure 7, element 74 and relevant disclosure thereto*).

Response to Arguments

6. The rejection of claims 15 - 27 under 35 U.S.C § 102(a), (b), and/or (e) and/or 103(a) – Suzuki et al., alone or in view of various references

Applicant(s) arguments have been considered but are moot in view of the new ground(s) of rejection. In so far as they apply to the present rejection of record, applicant(s) argue that Suzuki's underlayer is not directly adjacent the magnetic layer (*page 7 of response*). The Examiner respectfully disagrees.

The Examiner notes that Figure 1D represents one embodiment (a double layered perpendicular recording medium), but that is not the only embodiment supported by the Suzuki et al. disclosure. See the rejection of record, which clearly illustrates that Suzuki et al. supports embodiments wherein the magnetic layer is directly adjacent the underlayer.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

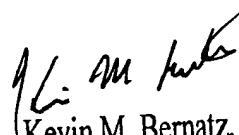
Applicants' amendment resulted in embodiments not previously considered (i.e. the removal of "Fe" and the insertion of "directly") which necessitated the new grounds of rejection, and hence the finality of this action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMB
June 22, 2006



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Primary Examiner